

On page 45 line 7 after "time", add -period-

Abstract line 16 change "Time-OF-Flight" to -Time-Of-Flight-

In the Drawings:

In Figure 10, reference number 108 is being added to identify the quadrupole (which is referenced on page 5, line 19).

In the Claims:

Please amend the claims as follows, and add new Claims 157-174:

33.

(Once Amended) An apparatus for analyzing chemical species comprising:

- (a) at least one vacuum pumping stage;
- (b) an ion source for producing ions from a sample substance;
- (c) a multipole ion guide located in at least one of said vacuum pumping stages;
- (d) a Time-Of-Flight mass analyzer;
- (e) means for delivering ions from said ion source into said multipole ion guide;
- (f) means for applying voltages to said multipole ion guide to direct said ions along a desired ion trajectory within said multipole ion guide; and, [means for delivering ions from said multipole ion guide into said Time-Of-Flight mass analyzer;]
- (g) means for applying additional voltages which impart energy to said ions within said multipole ion guide so as to cause [means for fragmenting ions located in said multipole ion guide comprising means for application of electrical voltages to said multipole ion guide to operate said multipole ion guide in a manner which results in] fragmentation of said ions located within said multipole ion guide . [; and]
- [(h) means for conducting Time-Of-Flight mass analysis of ions from said multipole

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ion guide.]

B5 37
62. (Once Amended) An apparatus for analyzing chemical species comprising:

- (a) at least one vacuum pumping stage;
- (b) an ion source for producing ions from a sample substance;
- (c) a multipole ion guide located in at least one of said vacuum pumping stages;
- (d) a Time-Of-Flight mass analyzer;
- (e) means for delivering ions from said ion source into said multipole ion guide;
- (f) means for applying an RF voltage to said multipole ion guide; and [means for delivering ions from said multipole ion guide into said Time-Of-Flight mass analyzer;]
- (g) means for applying an additional AC and DC voltage to said multipole ion guide to operate said multipole ion guide in a manner which results in mass to charge selection of ions located in said multipole ion guide which is in addition to the low m/z cutoff inherent in RF only operation of said multipole ion guide. [means for conducting mass to charge selection of ions located in said multipole ion guide comprising means for applying electrical voltages to said multipole ion guide to operate said multipole ion guide in a manner which results in mass to charge selection of ions located in said multipole ion guide; and]
- [(h) means for conducting Time-Of-Flight mass analysis of ions from said multipole ion guide.]

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49. (Once Amended) An apparatus according to Claim 49, wherein said multipole ion guide comprises entrance and exit ends and wherein said entrance and exit ends further comprise [means for conducting mass selection of ions comprises] electrodes located at said entrance and exit ends of said multipole ion guide.

- 68, 90.
- 37
- (Once Amended) An apparatus for analyzing chemical species comprising:
- (a) at least one vacuum pumping stage;
 - (b) an ion source for producing ions from a sample substance;
 - (c) a multipole ion guide located in at least one of said vacuum pumping stages;
 - (d) a Time-Of-Flight mass analyzer;
 - (e) means for delivering ions from said ion source into [at least one of] said multipole ion guide; [s,]
 - (f) means for applying an RF voltage to said multipole ion guide [means for delivering ions from at least one of said multipole ion guides into said Time-Of-Flight mass analyzer];
 - (g) means for applying an additional AC and DC voltage to said multipole ion guide to operate said multipole ion guide in a manner which results in mass to charge selection of ions located in said multipole ion guide which is in addition to the low m/z cutoff inherent in RF only operation of said multipole ion guide; [means for fragmenting ions located in at least one of said multipole ion guides comprising means for application of electrical voltages to at least one of said multipole ion guides to operate at least one of said multipole ion guides in a manner which results in fragmentation of ions located in at least one of said multipole ion guides]; and,
 - (h) means for applying additional voltages which impart energy to said ions within said multipole ion guide so as to cause fragmentation of said ions located within said multipole ion guide. [means for conducting mass to charge selection of ions located in at least one of said multipole ion guides comprising means for applying electrical voltages to at least one of said multipole ion guides to operate at least one of said multipole ion guide in a manner which results in mass to charge selection of ions located in at least one of said multipole ion guides; and]
 - [(i) means for conducting Time-Of-Flight mass analysis of ions from said at least one of said multipole ion guides.]

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104.

(Once Amended) A method of analyzing chemical species utilizing an ion source, a vacuum system with at least one vacuum pumping stage, a multipole ion guide located in at least one of said vacuum pumping stages, and a Time-Of-Flight mass analyzer, said method comprising:

- (a) producing ions from a sample substance using said ion source;
- (b) directing said ions into said multipole ion guide;
- (c) fragmenting ions in said multipole ion guide to form an ion population in said multipole ion guide which contains fragment ions; and,
- (d) conducting mass to charge analysis of at least a portion of said ion population with said Time-Of-Flight mass analyzer.

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120.

(Once Amended) A method of analyzing chemical species utilizing an ion source, a vacuum system with at least one vacuum pumping stage, a multipole ion guide located in at least one of said vacuum pumping stages, and a Time-Of-Flight mass analyzer, said method comprising:

- (a) producing ions from a sample substance using said ion source;
- (b) directing the ions into said multipole ion guide;
- (c) conducting ion mass to charge selection in said multipole ion guide to produce an ion population of mass to charge selected ions; and,
- (d) conducting mass to charge analysis of at least a portion of said ion population [said selected ions] with said Time-Of-Flight mass analyzer.

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135.

(Once Amended) A method of analyzing chemical species utilizing an ion source, a vacuum system with at least one vacuum pumping stage, at least one multipole ion guide, each of said multipole ion guides being located in at least one of said vacuum pumping stages, and a Time-Of-Flight mass analyzer, said method comprising:

- (a) producing ions from a sample substance using said ion source;
- (b) directing the ions into at least one of said multipole ion guides;

68

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- (c) conducting ion mass to charge selection in at least one of said multipole ion guides to produce an ion population of mass to charge selected ions;
- (d) fragmenting at least a portion of said ion population of said selected mass to charge value ions in at least one of said multipole ion guides to form a population of fragment ions in at least one of said multipole ion guides; and,
- (e) conducting mass to charge analysis of at least a portion of said population of said fragment ions with said Time-Of-Flight mass analyzer.

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~~157.~~ An apparatus as claimed in Claim ~~33~~, further comprising means for delivering ions from said multipole ion guide into said Time-Of-Flight mass analyzer.

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~~158.~~ An apparatus as claimed in Claim ~~62~~, further comprising means for delivering ions from said multipole ion guide into said Time-Of-Flight mass analyzer.

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~~68~~

~~159.~~ An apparatus as claimed in Claim ~~90~~, further comprising means for delivering ions from said multipole ion guide into said Time-Of-Flight mass analyzer.

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~~160.~~ An apparatus as claimed in Claim ~~33~~, wherein said Time-Of-Flight mass analyzer is configured with an orthogonal pulsing region.

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~~161.~~ An apparatus as claimed in Claim ~~62~~, wherein said Time-Of-Flight mass analyzer is configured with an orthogonal pulsing region.

~~88~~

~~68~~

~~162.~~ An apparatus as claimed in Claim ~~90~~, wherein said Time-Of-Flight mass analyzer is configured with an orthogonal pulsing region.

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~~163.~~ An apparatus as claimed in Claim ~~33~~, wherein said multipole ion guide comprises collision gas within said multipole ion guide.

69

~~33~~ 164. An apparatus as claimed in Claim ~~32~~ 163, wherein the pressure within at least a portion of said multipole ion guide is in the range of 10^{-4} to 10^{-2} torr.

~~34~~ 165. An apparatus as claimed in Claim ~~33~~ 163, wherein the pressure within at least a portion of said multipole ion guide is in the range of 10^{-4} to 10^{-1} torr.

~~82~~ 166. An apparatus as claimed in Claim ~~68~~ 90, wherein said multipole ion guide comprises collision gas within said multipole ion guide.

~~83~~ 167. An apparatus as claimed in Claim ~~82~~ 166, wherein the pressure within at least a portion of said multipole ion guide is in the range of 10^{-4} to 10^{-2} torr.

~~84~~ 168. An apparatus as claimed in Claim ~~82~~ 166, wherein the pressure within at least a portion of said multipole ion guide is in the range of 10^{-4} to 10^{-1} torr.

~~35~~ 170. An apparatus as claimed in Claim ~~487~~ 35, wherein said multipole ion guide extends from one of said vacuum pumping stages into a subsequent one of said vacuum pumping stages.

~~67~~ 171. An apparatus as claimed in Claim ~~170~~ 67, wherein said multipole ion guide extends from one of said vacuum pumping stages into a subsequent one of said vacuum pumping stages.

~~171~~ 172. An apparatus as claimed in Claim ~~85~~ 171, wherein said multipole ion guide extends from one of said vacuum pumping stages into a subsequent one of said vacuum pumping stages.

~~36~~ 173. An apparatus as claimed in Claim ~~172~~ 36, wherein said means for applying additional voltages comprises means for applying voltages to accelerate ions from outside said ion guide into said ion guide.

~~173~~ 174. An apparatus as claimed in Claim ~~86~~ 173, wherein said means for applying additional